

Yarboro Residence, Melvin
2205 Oakhill Dr.
Greensboro
GW Inc. # 10017

1st Report Legacy Env 5/20/95
Comprehensive Monitoring Report 11/8/96
Legacy

15.1 COMPREHENSIVE SITE ASSESSMENT (CSA)

The CSA sufficiently characterizes the cause, significance and extent of groundwater and soil contamination such that a Corrective Action Plan (CAP) can be developed.

A CSA for groundwater and soil contamination is required if any of the following requirements apply:

1. Contaminant concentrations in groundwater exceed the 15A NCAC 2L groundwater standards
2. Free product is present on the water table
3. Contaminated soil is in contact with groundwater or in proximity to groundwater
4. The Division of Environmental Management or other regulatory agency requests it
5. For petroleum contaminated sites, in-situ soils exceeding the final cleanup level determined by the SSE exist outside the spatial boundaries described in Section 8 "Limiting Quantities and Costs of Soil Treatment/Disposal".

NOTE: *The Executive Summary should provide a brief overview of the pertinent site information, i.e., it should provide sufficient information to acquaint the reader with the who, what, when, where, why and how of site activities to date.*

3. Table of Contents

- a. First page number for each section listed
- b. List of Figures (all placed in a single section following contents text)
- c. List of Tables (all placed in a single section following contents text)
- d. List of Appendices

4. Site History and Source Characterization

- a. Give a history of property ownership and use. Discuss chronology with references, lists and tables indicating owners/operators, dates of ownership (immediately prior to 1/1/74 through the present), uses of site and potential sources, which may include UST's, aboveground storage tanks (AST's), chemicals used and stored onsite, hazardous substances, etc.
H.O. UST removed 7/24/93
- b. Summarize release incidents and environmental investigations of known contamination. Discuss current and previous releases including but not limited to dates, sources, extent, inventory discrepancies, system tightness test, odors, stained soils, observed product, samples taken, previous enforcement orders, civil penalty assessments, etc. Reference any previous reports
release confirmed in samples taken at tank closure
- c. Summarize corrective actions to date (reference any reports), emergency response/initial abatement, free product recovery and primary and secondary source removal
tank removed

5. Potential Receptors and Migration Pathways

tributary to Buffalo Lake ~ 1500 ft to east
city water
This section should include identification and location of water supplies within 1500 feet of the contamination; surface water intakes for public water supplies within 0.5 mile; identification of adjacent property owners; identification of subsurface utilities; availability of municipal water lines and identification and discussion of the potential impacts that different pathways may have on contaminant migration (e.g., septic leach fields, utility lines and the effects of fluid mounding, etc.).

Reference the required figures and tables in subsections 10 and 11 below.

9. References

- a. Interview summaries, including dates, contacts, etc.
- b. File reviews for onsite/offsite sources
- c. Resource materials cited

10. Figures (All figures should include scale, north arrow, and site location in addition to the information listed below)

- a. 7 1/2 minute USGS topographical quadrangle map (photocopied portion)
 - indicate water supplies within 1500 feet
 - quadrangle name
 - north arrow
 - scale
- b. County road map
 - include primary/secondary road numbers
- c. Site base map/plan
 - North arrow
 - Surface features including property boundaries, roads/easements/rights of way, existing and previous building/structure, pavements, product or chemical storage areas, surface water bodies, drainage ways, wetlands, etc.
 - Subsurface features including underground storage tank systems (former/existing), basements, utilities, wells of all types, septic tanks, etc.

NOTE: All reports submitted to DEM should make use of graphical methods of data presentation to the greatest extent possible. An appropriate number of useful and topical maps, figures and tables should be provided so that rapid and comprehensive reviews of site data are possible. Furthermore, the text of reports should provide a concise synthesis of this graphical information so as to clearly communicate the preparer's own interpretations of the data.

If possible, a single base map should be used to prepare site plans, potentiometric maps, isocontour maps, etc. using a map scale of 1 inch = 100 feet. Maps and figures submitted to DEM should include conventional symbols.

2 for different j.
dates

12-13-94

2-17-95

Potentiometric/groundwater elevation contour map

- Superimpose on a base map
- Show and label source location(s), monitor wells and recovery wells
- Note water level elevations at wells
- Note footnote pumping conditions
- Identify and locate datum (arbitrary 100', USGS, NGVD) or benchmark
- Use appropriate contour interval
- Show direction of groundwater flow and average gradient

NOTE: A separate map (modified base map) or acetate overlays may be used for all potentiometric contour maps.

k. Free product thickness map

- Superimpose on a base map with all wells labelled and thickness noted at wells
- Use appropriate contour interval (0.01 foot minimum)
- Note date and method of measurement

NOTE: Acceptable methods of free product measurement include interface probes, tape/paste, or other DEM pre-approved methods only.

l. Contaminant isoconcentration contour map(s)

- Superimpose on a base map with all wells labeled
- Label wells with contaminant, concentration and footnote date of sampling
- Plot total volatile (if applicable) and most widespread contaminant, most concentrated contaminant, (if warranted)

NOTE: For all applicable plots, a 15A NCAC 2L standard contour must be shown in bold. A series of wells with contaminant levels near or below the 2L standard will be required to demonstrate this condition.

d. Summary table of dissolved contaminant concentrations in groundwater

- Include "at risk" water supply wells, contaminated supply wells, monitor wells, sample identification numbers referenced on base map, analytical methods and units of measure

12. Appendices

a. relevant information

- ✓ - Standard operating procedures used at site for sampling, equipment decontamination, field screening, well construction, well gauging, etc.
- ✓ - Boring logs and soil descriptions
- Well construction records
- Chain-of-custody forms
- ✓ - Laboratory reports for all samples
- NA - List and/or copies of permits received, permitting agency, permit number and date issued
- NO - Other documentation as appropriate (e.g., tank/line tightness results, aquifer tests)

Screened Depth

MW-1	7'-22'
MW-2	14'-34'
MW-3	14'-34'
MW-4	22'-34'
MW-5	14'-34'

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5. For petroleum contaminated sites, in-situ soils exceeding the final cleanup level determined by the SSE exist outside the spatial boundaries described in Section 8 "Limiting Quantities and Costs of Soil Treatment/Disposal".

Submit a CSA report to the appropriate regional office. Guidelines for preparing a CSA report appear below. As the CSA report format addresses both soil and groundwater contamination, submit only one report for a site. All sections must be addressed for groundwater contamination; however, for incidents where only soil contamination exists, subsections 7, 10 (J, K, L, M) and 11 (D) may be omitted from the CSA report. Do not submit separate CSA reports for an incident with both soil and groundwater contamination.

15.2 COMPREHENSIVE SITE ASSESSMENT (CSA) FORMAT

Minimum Elements of CSA Reports:

1. Title Page

a. Relevant site information

- Site name, incident identification No. # (if applicable) and location
- Date report submitted
- Responsible party and author of report.

2. Executive Summary

a. Source information

heating oil
550 gal UST
UIC

- Type of source (gasoline, diesel etc.)
- Container (tank, line, drum)
- Amount of release (gallons, estimated or know)

b. Initial abatement/emergency response information

2/24/93
no removal
now decont.

Qty of 660

- Tank Closure?
- Soil removal, quantity and disposition
- Amount of free product recovered and remaining (gallons, estimated)
- Alternative water supply availability and location

c. Damage/extent of release information including potentially affected receptors

1500ft east trib.
of Buffalo Lake
no utilities
in past contam.
soil
basement?
7
residential

Lead 45ppb MW-3
2-Methylnaphth. 60ppb MW-1
4 other heating oil type compounds
in MW-1

- Potentially affected receptors (e.g. water supply wells, surface waters, drinking water supplies)
- Subsurface structures (basements, vaults, etc.)
- Populations (residences, schools, parks, etc.)
- Maximum contaminant concentrations in soil and groundwater (lab data only)
- Groundwater estimated flow rate (ft/yr) and direction *E, SE*

d. Conclusions/recommended corrective action

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- c. Summarize corrective actions to date (reference any reports), emergency response/initial abatement, free product recovery and primary and secondary source removal

5. Potential Receptors and Migration Pathways

This section should include identification and location of water supplies within 1500 feet of the contamination; surface water intakes for public water supplies with 0.5 mile; identification of adjacent property owners; identification of subsurface utilities; availability of municipal water lines and identification and discussion of the potential impacts that different pathways may have on contaminant migration (e.g., septic leach fields, utility lines and the effects of fluid mounding, etc.).

Reference the required figures and tables in subsections 10 and 11 below.

6. Soils Investigation

Briefly discuss the site's soils and geology. Soil gas surveys results should be included if performed. Discuss how soil and geological characteristics may affect the migration and attenuation of contaminants. Reference the required figures and tables in Sections 10 and 11.

NOTE: Full reimbursement for soil treatment may not be approved without adequate evaluation of the most cost-effective treatment options.

7. Groundwater Investigation

7. location of horizontal wells
extent wells
horizontal
7. location of deep well
may be
vertical extent
may be
horizontal extent
- no slug test
no est of groundwater velocity
g.w. he
- added to
soil monitoring
report O/K
- Discuss the number, location and construction of monitor wells, in terms of the nature of contaminants (i.e., floaters vs. sinkers, placement of screened interval, etc.) and the aquifer contamination in both the vertical and horizontal extent (i.e., contaminated groundwater in saprolite vs. bedrock, upgradient vs. downgradient wells, etc.).
 - Discuss the plume's physical and chemical characteristics and significant features or mechanisms that could affect local groundwater flow patterns and plume migration.
 - Discuss the hydrogeologic conditions unique to the site such as vertical permeability of the unsaturated zone, hydraulic conductivity of the saturated zone, aquifer characteristics, confining beds, and depth to the seasonal high water table.
 - Discuss justification for all well locations and screening intervals.

Reference the required figures and tables in Sections 10 and 11.

NOTE: If large volumes of contaminated water are to be generated during aquifer testing, use slug tests to gather interim data for developing CSA while awaiting discharge permit for contaminated water.

8. Recommendations

discuss
Discuss the proposed preliminary corrective actions for developing a CAP and provide a rationale.

9. References

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notations, labelling, legends and north arrows and conform to generally accepted practices of map presentation such as those enumerated in the U.S.G.S. Geological Survey pamphlet, "Topographic Maps".

N/A

- d. Receptor well map showing location of all downgradient water supplies within 1,500 feet of contamination including surface water intakes for public water supply, all water supply wells, and irrigation wells. Provide a table listing well owner and pertinent construction details keyed to the figure. The map scale should be 1 inch = 400 feet.

If no water supplies exist within 1500 feet, state this with references in report and on the map.

- e. Local monitoring well map showing location of all monitoring wells for off-site sources within 1,000 feet of the site.

- f. Designation of subsurface utilities, lines, conduits, basements and other structures potentially at risk from free product and/or vapors (note whether they intercept the water table)

- ✓ g. Soil sample (grabs, boring, etc.) locations superimposed on base map

- h. Cross-sections through the contaminated soil

- Show at least at least two profiles crossing at or near right angles
- Indicate sample location results noted adjacently
- ⊖ Delineate vertical extent of contamination (preferably in cross section)
- Indicate subsurface profiles, illustrated fill, bedrock and outcrops, intersecting conduits, structures (if applicable)
- N/A - Show SSE contour (if applicable)

- Ⓢ i. Isoconcentration contour map(s) of soil contamination

- Show horizontal and vertical contaminant extent in unsaturated zone
- Delineate concentrations above the action level established for soil remediation with a bold contour
- Delineate the Site Sensitivity Evaluation (SSE) cleanup level with a bold contour
- Include SSE form (if applicable)

Soil extent
not defined
esp. g. & e. & SSE

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only m. Contaminant isoconcentration contour crosssections

- Use at least two orthogonal sections that transect the contaminated zone
- Label wells with contaminant concentrations and footnote date of sampling
- Use vertical and horizontal scales
- Depict surface topography and stratigraphy
- Depict screened intervals of wells and water levels
- Note potentiometric elevations for each well and soil boring
- Footnote horizontal and vertical gradient

NOTE: *Data from at least one upgradient and one well or well cluster (i.e., nested or proximal shallow and deep wells) are required to accurately construct these sections. At least deep well or well cluster must demonstrate contaminant levels at or below the appropriate 2L standard.*

11. Tables

- NA*
- a. Table of water supply well construction details keyed to the appropriate figure(s)

Include well numbers that correspond to map, owner's name, address, well use and construction information.

- ✓ b. Table of adjacent property owners

Include names, addresses and telephone numbers and show adjacent properties on the site base map

- ✓ c. Table of field screening and laboratory data for soil

Reference sample identification numbers, sample type, (grab, split spoon, auger etc.), sample depth, total depth of boring, analytical method, units and dates of sampling and analysis on the site base map.

NOTES: *The measured point at top of casing must be permanently marked or noted in the field. The table of potentiometric surface elevations should be part of the potentiometric contour map if space allows.*

d. Summary table of dissolved contaminant concentrations in groundwater

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